

10006771-3

10/618.171

IN THE CLAIMS:

Please amend the claims as follows:

1-11. (cancelled)

12. (currently amended) A flex-based fuel cell, comprising:

a first flexible circuit; comprising:

a first flexible substrate, and

a porous metal/catalyst layer, wherein the porous metal/catalyst layer

comprises a plurality of pores oriented to distribute fuel to a catalyst substantially all
of the first flexible circuit using a capillary action;

~~a separation section adjacent the first flexible circuit;~~ and

~~a second flexible circuit adjacent the separation circuit first flexible substrate circuit,~~

wherein the first and the second flexible circuits are conformable to a substantially non-planar
shape.

13. (currently amended) The flex-based fuel cell of claim 12, wherein the
separation section is a further comprising a proton exchange membrane between said first and
second flexible circuits.

14. (currently amended) The flex-based fuel cell of claim 12, further comprising
wherein the separation section is a channel comprising deionized water between said first and
second flexible circuits.

10006771-3

10/618.171

15. (original) The flex-based fuel cell of claim 12, wherein the substantially non-planar shape comprises a cylinder.

16. (currently amended) The flex-based fuel cell of claim 15, wherein an interior of the cylindrical flex-based fuel cell ~~comprises~~ contains liquid fuel.

17. (original) The flex-based fuel cell of claim 16, wherein the liquid fuel is methanol.

18. (currently amended) The flex-based fuel cell of claim 12, further comprising a dry film adhesive disposed between the first flexible substrate and a [[the]] second flexible substrate which is part of the second flexible circuit.

19. (withdrawn) A flex-based fuel cell, comprising:
means for converting liquid fuel to protons, comprising:
means for transporting liquid fuel through the liquid fuel converting means,
and
first means for flexibly supporting the liquid fuel converting means;
means for receiving the protons, comprising:
means for converting the protons to water vapor, and
second means for flexibly supporting the proton converting means; and
means for exchanging the protons from the liquid fuel converting means to the proton converting means.

10006771-3

10/618.171

20. (withdrawn) The flex-based fuel cell of claim 19, wherein the liquid fuel transporting means comprises a porous metal layer having means for causing capillary transport of the liquid fuel within the porous metal layer.

21. (withdrawn) The flex-based fuel cell of claim 19, wherein the proton exchanging means comprises a proton exchange membrane.

22. (withdrawn) The flex-based fuel cell of claim 19, wherein the proton exchanging means comprises a deionized water channel.

23. (withdrawn) A method of preparing a flex circuit for a fuel cell, comprising: patterning a conductive material on flex supporting means having a front surface and a back, surface, wherein the conductive material is patterned on the front surface; attaching a layer of porous material to the conductive material; depositing a layer of catalytic coating on the surface of the porous material; and ablating the supporting means from the back surface to make openings so that the porous material is exposed.

24. (withdrawn) The method of claim 23, further comprising the step of coating the catalyst layer with a thin layer of proton transfer membrane.

25. (new) The flex-based fuel cell of claim 12, wherein said porous layer comprises metal.

10006771-3

10/618.171

26. (new) The flex-based fuel cell of claim 12, wherein said porous layer comprises a catalyst.

27. (new) A fuel cell having first and second flexible circuits comprising:
a first flexible substrate comprising an anode;
a porous layer at said anode having pores for distributing fuel to said anode using capillary action;
a catalyst disposed on said porous layer; and
a second flexible substrate comprising a cathode.

28. (new) The fuel cell of claim 27, further comprising a proton exchange membrane disposed between said anode and cathode.

29. (new) The fuel cell of claim 27, further comprising deionized water disposed between said anode and said cathode.

30. (new) The fuel cell of claim 27, wherein said first flexible substrate comprises a plurality of openings for passing fuel to said anode.

31. (new) The fuel cell of claim 27, wherein said second flexible substrate comprises a plurality of openings for passing an oxidant to said cathode.

32. (new) The fuel cell of claim 28, further comprising a passage for flowing recycled water from said cathode to said proton exchange membrane.

10006771-3

10/618.171

33. (new) The fuel cell of claim 27, wherein said first and second flexible

substrates are sealed together with an adhesive.

34. (new) The fuel cell of claim 27, wherein said first and second flexible substrates are formed into a cylinder.

35. (new) The fuel cell of claim 34, further comprising a fuel flow through an interior of said cylinder.

36. (new) The fuel cell of claim 34, further comprising an oxidant flow on an exterior of said cylinder.

37. (new) The fuel cell of claim 27, wherein said porous layer comprises a first porous layer disposed on said first flexible substrate and a second porous layer disposed on said second flexible substrate.